

OHSU HEALTH CARE SYSTEM PRACTICE GUIDELINES

ACUTE STROKE PRACTICE GUIDELINES FOR THE EMERGENCY DEPARTMENT HC.STK.100.GD

(includes ischemic stroke, TIA, intracerebral hemorrhage and non-subarachnoid hemorrhage)

Last Reviewed Date: November 2014

POLICY STATEMENT:

OHSU hospitals and clinics have adopted these practice guidelines in order to delineate a consistent, evidence-based approach to treating the patient who presents with signs and symptoms consistent with acute stroke. Although these guidelines assist in guiding care, responsibility to determine appropriate care for each individual remains with the provider themselves.

Outcomes/goals	<ol style="list-style-type: none"> 1. Rapid identification of vascular events. 2. Manage appropriately and efficiently according to Brain Attack Coalition guidelines. 3. Evaluate in a cost-effective manner.
Triage staff	<ul style="list-style-type: none"> • Clinical staff to see patient immediately upon arrival. If presenting with stroke signs/symptoms less than 12 hours from onset, notify ED provider. (Stroke symptoms include: Sudden onset of numbness or weakness of the face, arm or leg, especially on one side of the body; confusion, trouble speaking or understanding speech; trouble seeing in one or both eyes; trouble walking, dizziness, or loss of balance or coordination; severe headache with no known cause or “worst headache of my life.”) • Anticipate ED provider initial evaluation to be completed within 10 minutes of patient arrival — if stroke suspected, they will activate Stroke Alert via ECC Communications Center. • Consider calling Rapid Response Team if needed. • If onset of symptoms is greater than 12 hours or symptoms have resolved and ABC’s are stable, then triage level may be ESI Level 3. May upgrade the triage level based on nursing judgment. • Registration to be done at bedside.
ED registration	Prioritize for immediate bedside registration.
R.N.	<p>Notify CT to anticipate an emergent CT scan and enter order as Extreme Emergency if symptoms are persistent and onset is less than 12 hours.</p> <p>Obtain POC (point of care) glucose, unless EMS glucose value already known.</p> <p>Anticipate orders for:</p> <ul style="list-style-type: none"> • CT without contrast • Labs for CBC, INR, PTT, POC troponin and POC Chem 8 • 12 lead EKG • CXR (if clinically indicated)



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<p>ED physician</p>	<ul style="list-style-type: none"> • If symptom onset is less than 12 hours, evaluate for suspected acute stroke within 10 minutes of patient arrival if stroke suspected, activate Stroke Alert via the ECC (Emergency Communication Center), and initiate orders for “CT without contrast”; CBC, INR, PTT, POC troponin, POC Chem 8 and 12 lead EKG. Obtain CXR, if clinically indicated. • History: age, time of symptom onset (when last normal), duration, type of symptoms, medications (antiplatelets and anti-coagulants), past medical history (CAD, HTN, DM, previous TIA/stroke, PVD, seizures/epilepsy, tobacco, illicit drug use). • Exam: visual fields, extraocular muscles, speech impairment, weakness or sensory deficits, incoordination, ataxia.
<p>ED and Stroke Team physician</p>	<p>Actions based on duration of symptoms</p> <ol style="list-style-type: none"> 1. For persistent symptom onset less than 12 hours: <ol style="list-style-type: none"> a. Stroke Team to respond via phone to Stroke Alert page within 5 minutes and discusses case with ED provider. If patient determined to be a potential treatment candidate with thrombolytics and/or thrombectomy, the rapid acute stroke workup with continue as outlined in #2 below, and the Stroke Team will arrive in the department within 30 minutes, along with a clinical stroke coordinator, to evaluate patient for further treatment. If not a treatment candidate, the Stroke Alert will be considered a Stand Down and appropriate workup with continue in a timely manner. b. Consider thrombolytics for all ischemic stroke patients who present with symptom onset of 3 hours or less. Select patients may be considered for thrombolytics between 3-4.5 hours of onset. Follow OHSU Practice Standard for Intravenous Administration of t-PA in Acute Ischemic Stroke, as appropriate with goal of door to thrombolytics less than 60 minutes. c. Consider interventional radiology maneuvers for onset of symptoms of 12 hours or less. d. Other research options may be available for patients with onset of symptoms of 24 hours or less and initiated by the Stroke Team Physician. 2. For potential acute treatment candidates: <ol style="list-style-type: none"> a. Head CT to be initiated within 25 minutes of arrival and film reviewed by radiology (or Stroke Team physician) within 20 minutes of completion. Order “CT without contrast.” b. Labs, if indicated: CBC, INR, PTT, POC troponin and POC Chem 8 (must be completed and results available in Epic within 45 minutes of arrival). c. 12 lead EKG (must be completed and results ready for review within 45 minutes of arrival). d. CXR, if clinically indicated (must be completed and results ready for review within 45 minutes of arrival). 3. If CT subsequently shows intracranial hemorrhage (subarachnoid or intracerebral), request immediate neurosurgery consult and reverse any anti-coagulants. Refer to OHSU Practice Guidelines for the Inpatient Management of Patients with Intracerebral and Subarachnoid Hemorrhage. 4. For ischemic stroke or TIA with persistent symptom onset of greater than 12 hours, but less than 24 hours, have the ECC (Emergency Communication Center) contact the Stroke Team (pager 12600). Complete the items in 2 above in a timely manner, unless advised otherwise by the Stroke Team. 5. If symptom onset is greater than 24 hours, obtain CBC with diff, INR, PTT, BMS and call the neurology resident on call who will determine additional diagnostics that may be required. 6. If symptoms have resolved or are transient (TIA), see evaluation of TIA section below.

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<p>ED nurse</p>	<p>Interventions to be initiated upon arrival</p> <p>History:</p> <ol style="list-style-type: none"> 1. Age, time of symptom onset (when last normal), duration, present or improving. 2. History: coronary artery disease, coagulopathy, cardiac dysrhythmias, previous TIA/stroke, diabetes mellitus, seizure/epilepsy. 3. Medications / allergies. 4. Facilitate access to patient by bedside registrar. <p>Assessment:</p> <ol style="list-style-type: none"> 1. Obtain full set of vital signs, including focused neuro check. 2. Repeat every 15 minutes until patient condition stabilizes. <ul style="list-style-type: none"> • Attach cardiac monitor and assess need for supplemental oxygen. • Initiate 18G IV (will need 2 18G IV if a thrombolysis or angio candidate), obtain blood, send immediately to lab CBC, INR, PTT, and complete POC troponin and Chem 8. [CBC, INR, PTT, and POC Chem 8 results must be available within 45 minutes of arrival.] In addition, draw and hold blood bank tubes. Initiate second IV after CT. • Check fingerstick glucose (CBG) unless EMS glucose value is known. • Obtain 12 lead EKG within 45 minutes of arrival, and CXR, if clinically indicated (do not delay CT for EKG or CXR). • Initiate Social Services consult for family, if appropriate • No food, fluid or medications by mouth until a dysphagia screening has been completed and documented (see Bedside Nurse Swallow Screen, Cog/Neuro section of ED RN Advanced Navigator.
<p>C.N.A.</p>	<ul style="list-style-type: none"> • Assist ED nurse to undress patient into a hospital gown, perform vital signs and perform EKG (do not delay CT for EKG). • Complete patient belongings list. • Run elevator for emergent stroke patients as needed. • Document output.
<p>ED physician</p>	<ul style="list-style-type: none"> • Determine code intervention and review Advance Directives or POLST form, if present. • Initiate bed request for either NSICU or 10K based on admission criteria outlined below.

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<p>ED physician</p>	<p>Evaluation of probable TIA (deficit resolved)</p> <ol style="list-style-type: none"> 1. Admit to Observation Unit to complete evaluation as needed. 2. Obtain CT without contrast, CBC with diff, INR, PTT, BMS, and 12 lead EKG if not already performed in acute. 3. Bilateral duplexes of the carotid artery or CTA neck if symptoms consistent with anterior circulation and if not done within last three months. 4. MRI/MRA or CT/CTA if symptoms consistent with posterior circulation event (more than one of the following: diplopia, dysarthria, central vertigo, or ataxia). Inform radiology of possible pathology involving vertebral-basilar circulation if clinically relevant. 5. Nurse swallow screen to be completed prior to any po intake (see Bedside Nurse Swallow Screen, Cog/Neuro section of ED RN Advanced Navigator. 6. Fasting lipid levels in am. 7. Focused neuro checks every two hours. 8. Neurology consult on all cases of probable TIA. <ol style="list-style-type: none"> a. Symptoms still present or are recurrent. b. Acute stroke within past month. c. Carotid stenosis >50 % on symptomatic side. (These patients to be considered for stent of CEA.) d. MRI/MRA performed. 9. These patients should have follow-up arranged in the Stroke Clinic (503 494-7225)
<p>ED physician</p>	<p>Criteria for admission to Neurosciences ICU</p> <ol style="list-style-type: none"> 1. Acute stroke with moderate or worse deficits with symptom onset of <24 hours. 2. Post IV (intravenous) or IA (intra-arterial) thrombolytics or device thrombectomy. 3. Patients with hemispheric stroke in whom impending mental status decline and loss of protective airway reflexes is of concern. 4. Patients with basilar thrombosis or tip of the basilar syndrome. 5. Patients with crescendo TIAs. 6. Patient requiring blood pressure augmentation for a documented area of hypoperfusion. 7. Patients requiring IV blood pressure or heart rate control. 8. Patients requiring continuous cardiac monitoring. 9. Patients requiring every 1-2 hour neurological evaluation depending on symptom fluctuation or if ongoing ischemia is suspected. 10. Patients with worsening neurological status. 11. Patients post-interventional neuroradiology procedure. <p>Complete EPIC Orders, NEU: Stroke/Rule Out Stroke/TIA: Admission. .</p>
<p>ED physician</p>	<p>Criteria for admission to 10K:</p> <ol style="list-style-type: none"> 1. Acute stroke symptom onset >24 hours and not meeting above criteria. 2. Non-crescendo TIAs where workup not completed. <p>Complete Epic Orders, NEU: Stroke/Rule Out Stroke/TIA: Admission.</p> <p>Note: Remote telemetry is available on 10K that is monitored by 11K.</p>

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<p>ED physician</p>	<p>Criteria for discharge to home:</p> <ol style="list-style-type: none"> 1. Completion of evaluation. 2. No significant findings on the above workup. 3. Complete resolution and no recurrent symptoms. 4. Anti-platelet agents or resume anti-coagulation, if indicated. 5. Consider starting on a cholesterol-reducing agent if elevated fasting lipid levels. 6. Follow-up arranged in Stroke Clinic (503 494-7225). 7. Patient education and discharge teaching completed and provided in writing to include: personal risk factors, warning signs for stroke, activation of EMS, need for follow-up after discharge, medications prescribed, tobacco cessation counseling if smoked anytime in past 12 months.
<p>Blood pressure management in patients NOT eligible for thrombolytics</p>	
<p>ED physician</p>	<p>Systolic <220 or diastolic <120:</p> <ul style="list-style-type: none"> • Observe unless other end-organ involvement (e.g., aortic dissection, acute myocardial infarction, pulmonary edema, hypertensive encephalopathy). • Treat other symptoms of stroke (e.g., headache, pain, agitation, nausea, vomiting). Treat other acute complications of stroke, including hypoxia, increased ICP, seizures, or hypoglycemia.
<p>ED physician</p>	<p>Systolic >220 or diastolic 121-140:</p> <ul style="list-style-type: none"> • Labetalol 10-20 mg IV given over 1-2 minutes, followed by a labetalol infusion of 2-8 mg/min. <p>or</p> <ul style="list-style-type: none"> • Nicardipine 5 mg/hour IV infusion as initial dose; titrate to desired effect by increasing rate by 2.5 mg/hour every 5-15 minutes to maximum of 15 mg/hour. • Aim for a 10-15 % reduction in BP.
<p>Blood pressure management in patients eligible for thrombolytics</p>	
<p>ED physician</p>	<p>Prethrombolytics:</p> <p>Systolic >185 or diastolic >110</p> <ul style="list-style-type: none"> • Labetalol 10-20 mg IV given over 1-2 minutes. May repeat one time. <p>or</p> <ul style="list-style-type: none"> • Nicardipine 5 mg/hour IV infusion as initial dose; titrate to desired effect by increasing rate by 2.5 mg/hour every 5-15 minutes to maximum of 15 mg/hour. When desired blood pressure is attained, adjust as needed to maintain desired blood pressure.
<p>ED physician</p>	<p>During/after thrombolytics:</p> <ol style="list-style-type: none"> 1. Starting from beginning of IV tPA infusion check blood pressure every 15 minutes for 2 hours, then every 30 minutes for 6 hours, and then every hour for 16 hours. 2. Systolic >180 or diastolic >105: <ul style="list-style-type: none"> • Labetalol 10-20 mg IV given over 1-2 minutes, followed by a nicardipine drip as needed. Or Nicardipine 5 mg/hour IV infusion as initial dose; titrate to desired effect by increasing rate by 2.5 mg/hour every 5-15 minutes to maximum of 15 mg/hour. When desired blood pressure is attained, adjust as needed to maintain desired blood pressure.

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- Sacco, RL, et al. (2013). An Updated Definition of Stroke for the 21st Century: A statement for healthcare professionals from the AHA/ASA; AHA/ASA Expert Consensus Document. Stroke, 44:2064-2089.
- Kernan, WN, et al. (2014). Guidelines for the Prevention of Stroke in Patients with Stroke and Transient Ischemic Attack: A guideline for healthcare professionals from the AHA/ASA, Stroke, 45: 2160-2236.

Related Forms and Procedures:

- [OHSU Practice Standard for Intravenous Administration of t-PA in Acute Ischemic Stroke, HC.STK.101.GD](#)
- [Dosing Information for t-PA administration in Acute Ischemic Stroke](#)
- [OHSU Practice Standard for the Inpatient Management of Intracerebral Hemorrhage HC.STK.103.GD](#)
- [OHSU Practice Standard for the Inpatient Management of Subarachnoid Hemorrhage HC.STK.104.GD](#)
- [Adult Critical Care Standard of Care](#)
- [Adult Acute Care Inpatient Standard of Care](#)
- [Bedside Nurse Swallow Screen](#)

Education and Training Resources: None

Document History: None

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